

CLAIMS

We claim:

1. A microwave transmission system for use in communicating in confined spaces, such as mines, tunnels, industrial enclosures, buildings and the like, comprising:

an enclosure selected from the group consisting of a mine, a tunnel, an industrial enclosure, and a building; and

a pair of transceivers configured to transmit and receive signals through the enclosure at frequencies ranging from 5 GHz to 15 GHz.

2. The microwave transmission system of claim 1, wherein the frequencies range from 8 GHz to 12 GHz.

3. The microwave transmission system of claim 1, wherein the frequencies range between 10 GHz plus or minus three percent.

4. The microwave transmission system of claim 1, wherein the pair of transceivers are configured for duplex transmission of communications signals.

5. The microwave transmission system of claim 4, wherein the pair of transceivers each include circuitry for transmitting call signals and circuitry for detecting the call signals, where the call signals indicate a request for a call signal recipient to man one of the transceivers.

6. The microwave transmission system of claim 5, wherein the circuitry for detecting call signals further includes circuitry for confirming that the call signals have been detected.

7. The microwave transmission system of claim 1, wherein each transceiver in the pair of transceivers is configured to operate at a power output of 35 miliwatts or less.

8. The microwave system of claim 1, further comprising circuitry for detecting loss of signal lock.

9. The microwave system of claim 8, wherein the circuitry for detecting loss of signal lock comprises means for detecting loss of signal lock on the basis of signal strength.

10. The microwave system of claim 8, wherein the circuitry for detecting loss of signal lock comprises means for detecting loss of signal lock on the basis of center tuning.

11. The radio system of claim 1, wherein the pair of transceivers are configured to operate from power supplied by a 12 volt automotive battery.

12. A method of communicating by radio in confined spaces, such as mines, tunnels, industrial enclosures, buildings and the like, comprising:

positioning a first transceiver within an enclosure selected from the group consisting of a mine, a tunnel, an industrial enclosure, and a building;

placing a second transceiver in a position where the second transceiver is capable of signal communications with the first transceiver; and

transmitting and receiving microwave signals through the enclosure between the first and second transceivers where the microwave signals are transmitted at frequencies ranging from 5 GHz to 15 GHz.

13. The method of claim 12, wherein the frequencies used in the step of transmitting range from 8 GHz to 12 GHz.

14. The method of claim 12, wherein the frequencies used in the step of transmitting range between 10 GHz plus or minus three percent.

15. The method of claim 12, wherein the step of transmitting includes transmitting and receiving a duplex signal.

16. The method of claim 15, further comprising a step of sending a call signal from one of the first transceiver and the second transceiver, where the call signal indicates a request to communicate through use of the transmitting step.

17. The method of claim 16, further comprising a step of the other of the first transceiver and the second transceiver sending a confirmation signal upon receipt of the call signal, where the confirmation signal indicates that the call signal was received.

18. The method of claim 12, wherein the step of transmitting includes transmitting a power of 35 milliwatts or less.

19. The method of claim 12, further comprising a step of detecting loss of signal lock in a duplex transmission.

20. The method of claim 19, wherein the step of detecting loss of signal lock includes detecting loss of signal lock on the basis of signal strength.

21. The method of claim 19, wherein the step of detecting loss of signal lock includes detecting loss of signal lock on the basis of center tuning.

22. The method of claim 12, further comprising a step of connecting one of the first transceiver and the second transceiver to a 12 volt automotive battery.